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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/046,071	01/11/2002	Stephen D. O'Connor	270/219	3632

7590 10/07/2003
Vincent K. Gustafson
NANOSTREAM, INC
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Pasadena, CA 91107-2928

EXAMINER

DRODGE, JOSEPH W

ART UNIT	PAPER NUMBER
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1723

DATE MAILED: 10/07/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/046,071	Applicant(s) O'CONNOR ET AL.	
	Examiner Joseph W. Drodge	Art Unit 1723	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-87 is/are pending in the application.
- 4a) Of the above claim(s) 1-46, 86 and 87 is/are withdrawn from consideration.
- 5) ☒ Claim(s) 47-55 is/are allowed.
- 6) ☒ Claim(s) 56-85 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☒ Claim(s) 1-46, 86 and 87 are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). ____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) <u>0803</u> . | 6) <input type="checkbox"/> Other: |

NON-FINAL REJECTION

It is noted that the instant claims presented for prosecution there was no claim 10. Hence, claims 11-88 have been renumbered under Rule 1.126 as claims 10-87.

Restriction to one of the following inventions is required under 35 U.S.C. 121:

- I. Claims 1-46, drawn to a microfluidic device containing stencil layers and overlap regions, classified in class 366, subclass 336.
- II. Claims 47-85, drawn to a microfluidic device containing channels in separate layers joined by slits, apertures or expansion regions of different cross-sections in third layers, classified in class 366, subclass 341.
- III. Claims 86 and 87, drawn to a microfluidic device containing channels with forked regions, classified in class 366, subclass 337.

The inventions are distinct, each from the other because:

Inventions I, II and III are related as subcombinations disclosed as usable together in a single combination. The subcombinations are distinct from each other if they are shown to be separately usable. In the instant case, invention I has separate utility such as in microfluidic devices containing less than three layers as in Group II or not containing forked regions as in Group III. See MPEP § 806.05(d).

Because these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification, restriction for examination purposes as indicated is proper.

Because these inventions are distinct for the reasons given above and the search required for Group I is not required for Group II or Group III, respectively,

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restriction for examination purposes as indicated is proper. Because these inventions are distinct for the reasons given above and have acquired a separate status in the art because of their recognized divergent subject matter, restriction for examination purposes as indicated is proper.

During a telephone conversation with Vincent Gustafson on September 25, 2003 a *provisional election* was made without traverse to prosecute the invention of Group II, claims 47-85. Affirmation of this election must be made by applicant in replying to this Office action. Claims 1-46 and 86 and 87 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

ALLOWABLE SUBJECT MATTER

Claims 47-55 are deemed to distinguish over all of the prior art. Independent claim 47 distinguishes in view of recitation of a microfluidic device having expansion/contraction devices in series in which each has an aperture in a second layer of relatively smaller cross-sectional area and an expansion channel in a first or third layer of relatively larger cross-sectional area.

The closest prior art is deemed to comprise Hu et al patent 6,623,860; Zanzucchi et al patent 5,985,119; Bennett et al patent 6,494,614 and Burdon et al patent 6,572,830 all of whom disclose complex, multi-layer microfluidic devices for mixing and reacting different fluids in which inlet channels for the respective fluids are introduced in respective channels and optionally in different layers which are connected through reservoirs, overlapping regions, slits or apertures of varied cross section; however, none of such prior art suggests expansion/contraction regions in series as recited in instant claim 47.

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The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 56-85 are rejected under 35 U.S.C. 102(e) as being anticipated by Hu et al patent 6,623,860.

Firstly, it is noted that the instant Application is a CIP of Application 09/632,681 having an earlier effective filing date. However, after review of '681, it is deemed that '681 does not provide clear support for the now elected claims. Therefor, 09/632,681 does not provide an earlier effective filing date for claims 56-85 of the instant application.

With respect to independent claims 56,65 and 74, Hu et al disclose a multi-layer, complex, microfluidic device for mixing and reacting chemical and biological fluid streams comprising a plurality of layers, each having communicating channels, reservoirs and overlap regions, the channels being connected by vias, overlap regions or connecting channels (Abstract, etc.), there being any desired plurality of inlet and outlet channels for providing mixed fluid streams (column 10, lines 30-45), junction channels (column 7, lines 60-64) and slits or apertures between channels that optionally are in separate layers and may be disposed parallel to the channels they are connecting (column 9, lines 1-10, etc.).

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Regarding claim 65, the slits may be of smaller cross-section (column 7, lines 42-46 and lines 52-61).

Regarding claim 74, there may be a plurality of apertures connecting the channels (column 6, lines 40-67, etc.).

Regarding claim 66, some slits may be of relatively large width (column 7, lines 62-64).

Regarding claim 67, the slits may be of varied orientation relative to the channels connected (column 9, lines 1-5 and 26-29).

Regarding claims 59,60,69,70,82 and 83, the channels may or may not be through the entirety of the thickness of respective layers (column 4, lines 7-10 and column 5, lines 12-25).

Regarding claims 61, 70 and 83, see column 8, line 51-column 9, line 1 regarding micromachining.

Regarding claims 62,71 and 80, the channels may be in series (column 6, lines 59-64; column 18, lines 9-12, etc.)

Regarding claims 63,64,72,73,84 and 85, varied bonding and sealing techniques are disclosed (see column 9, lines 11-40).

Regarding claims 58,75,77 and 78, varied aperture, slit and channel widths and lengths are disclosed (column 7, lines 42-54, etc.).

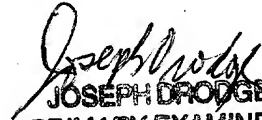
Claim 79 is objected to because of the following informalities: In line 5, "us" should be "is". Appropriate correction is required.

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Any inquiry concerning this communication or other matters pertaining to prosecution should be directed to Examiner Joseph Drodge at telephone number (703) 308-0403 Monday-Friday between 8:30 and 4:45. The Fax number for the Examining Group is (703) 872-9306.

JWD

September 30, 2003


JOSEPH DRODGE
PRIMARY EXAMINER